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ABSTRACT

This study examined the psycholinguistic implications of using either of two different types of orthography--syllabic and roman--in Native language programs for Cree children with regard to readability, learnability, and the transfer of reading skills to and from reading in an official language (English or French). This study can also be applied to Ojibwa and Montagnais languages, which share structural features and orthographic problems with Cree. Elementary school children in Ontario of Cree background were studied both through limited research conducted on a psychological level and more broadly through reading instruction classes in bilingual education programs. While the orthographies of the official languages represent a more abstract level, both types of Cree orthographies tend to represent the phonemic level and generally operate similarly. Results show the following differences: (1) it may be easier for very young children to manipulate syllables rather than phonemes; (2) words written in syllabics may be shorter and less complex than those written in the roman script; (3) certain grapheme reversals may cause more problems for learners of syllabics than of the roman system; and (4) if students are going from one orthography to a different type (syllabics to official language and vice versa), they will have to learn new materials and concepts. However, if the transfer is made from a Native roman orthography to an official language or vice versa, the risk of confusion of the two systems is much greater. Implications for further research are discussed. (Author/MHP)

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Orthography Choice for Cree Language in Education

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INTRODUCTION

The practical need for the examination of Native (Amerindian) orthographies in an educational light has grown dramatically in the last decade. Schools for Native children have begun to use Native languages in various ways in their programs. Almost inevitably the formal teaching of literacy skills in a Native language is involved. For the largest group of Amerindians in the province of Ontario, the Cree and the Ojibwa, two different types of orthography -- syllabic and roman -- are available for school use. The purpose of this study is to examine the psycholinguistic implications of using one or other of these types of orthography in various kinds of Native language programs for Cree children.

Two considerations are relevant for programs that involve Native literacy in any way. One is the relative learnability and readability of the Native orthographies to be used. The second is the transfer of literacy skills to and from literacy in an official language (English or French), since literacy in an official language is always part of a Native school program. In some programs Native literacy precedes official language literacy and in others it is begun after official language literacy is established. Therefore, the potential for transfer of literacy skills in either direction has to be considered.

Two types of evidence are used in this study. The first is evidence which can be broadly referred to as psychological research. By this we mean research on cognitive functioning, psycholinguistic research, linguistic theory and theory of perception. Unfortunately for our present purposes, most of this kind of information consists of studies involving only one language and one orthography. Comparisons between radically different orthographies and between languages are rare. The second type of evidence is research on the teaching of reading in bilingual education programs in a number of contexts. This evidence is derived from a comparison of the findings of various evaluations of such programs.

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The Population and the Schools

The population for this study is elementary school children in Ontario of Cree background. Among the Cree speaking population of the province, there are those who use a syllabic orthography to represent their language and those who use a roman orthography. Many speakers do not write in their Native language. Cree has many dialects and no

single dialect is considered standard or preferred as is the case with European languages. Although the Cree are the population considered here, and Cree examples are used throughout, the same characteristics hold for Ojibwa and Montagnais which are closely related languages in Canada. These languages share with Cree, the structural features and orthographic problems which are the concern of this study.

We have limited our considerations to the first six or seven years of formal schooling. It is during these years that the basic literacy skills are generally established. And it is for these grades that the new or proposed Native language programs have been or are being developed. However, many of the points made here are relevant to older learners and users of Native orthographies.

In recent years several approaches to the inclusion of the Native languages in education for Native children have been initiated. There are basically four types of Native language program which have been established. The two most common are programs which are inserted as separate entities, i.e. subjects of instruction, into otherwise standard provincial school curricula. For children who come to school speaking only or mainly an official language, there are Native language as a second language programs. For children who come to school speaking only or mainly a Native language, there are Native language enrichment and Native language literacy programs. In both these types of programs, use of the Native language is highly restricted. In the literature, such a limited use of one of the languages in education is not usually referred to as 'bilingual education.' However, for our purposes, the examination of the teaching of reading, we will consider both of the above types of program to be forms of bilingual education primarily because they share many relevant problems with other programs referred to as bilingual education in North America and elsewhere.

The other two types of Native language program are much more rare. They involve a change in the medium of instruction from the child's first language. One is the vernacular transition type of program in which a Native-speaking child begins his education in his mother tongue. Then gradually over a transition period of usually three to five years the school language is switched to the official language. Such a program for literacy has been developed in Manitoba for a transition from Cree and Ojibwa to English. The fourth type of program is the immersion approach. The official language speaking child receives all initial schooling in the Native language and later receives part of his education in his mother tongue. At West Bay, Ontario, where many of the children do not know their traditional language, Ojibwa, an immersion approach is being tried, where Ojibwa is the immersion language and instruction in English, the mother tongue, is introduced later in the school program.

The Orthographies

There are many varieties of both syllabic and roman systems of Cree orthography in use at the present. We have chosen a version of each that is described in the published literature. In general, the differences among the varieties in use are minor enough that the present

discussion may be considered relevant to Cree roman and syllabic orthography varieties as a whole.

Syllabics

Historically all the current syllabic orthographies for Canadian Native languages derive from the syllabic orthography for Cree developed by a Methodist missionary, James Evans, in 1840.[1] Although the original syllabary of Evans has undergone several relatively trivial changes over time, the extant Cree syllabaries fully illustrate the basic principles which are used in all the syllabic systems derived from Evans' original. Figure 1 shows the two main varieties of syllabic orthographies with some internal variations as well.

Eastern and Western Syllabaries[2]

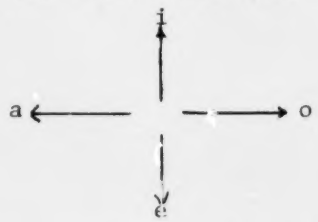
Consonant	Vowels				Finals	
	e	i/ii	o/oo	a/aa	West	East
none/h/ʔ	ᐁ	ᐃ	ᐅ	ᐊ	ᐦ h	ᐦ h ᐃ ʔ
w (West)	ᐁ•	ᐃ•	ᐅ•	ᐊ•	o	
(East)	•ᐁ	•ᐃ	•ᐅ	•ᐊ		ᐤ or •ᐃ
p	ᐯ	ᐱ	ᐳ	ᐸ	ᑊ	ᐸ ᐱ
t	ᑌ	ᑎ	ᑐ	ᑕ	ᐟ	ᑕ ᑎ
m	ᒣ	ᒥ	ᒧ	ᒪ	ᒡ	ᒪ ᒥ
c	ᒉ	ᒋ	ᒍ	ᒐ	–	ᒐ ᒋ
k	ᖿ	ᖾ	ᖽ	ᖼ	ᐧ	ᖼ ᖾ
y	ᖻ	ᖺ	ᖹ	ᖸ	•	ᖸ ᐤ ᐁ
s	ᔆ	ᔑ	ᔐ	ᔏ	ᔅ	ᔏ ᔑ
n	ᓀ	ᓂ	ᓄ	ᓇ	ᓗ	ᓇ ᓄ
š	ᔉ	ᔓ	ᔒ	ᔍ	ᔪ	ᔍ ᔓ
l (West)	ᒼᐁ	ᒼᐃ	ᒼᐅ	ᒼᐊ	ᒼ	
(East)	ᓭ	ᓯ	ᓰ	ᓫ		ᓫ
r (West)	ᕒᐁ	ᕒᐃ	ᕒᐅ	ᕒᐊ	ᕒ	
(East)	ᕓ	ᕆ	ᕇ	ᕂ		ᕃ
					ᐣ	sk ᐣ
					×	hk

Figure 1

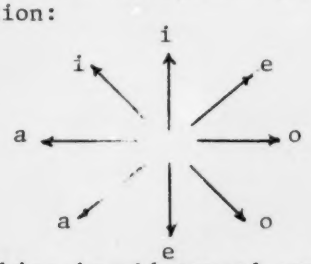
The syllabic system is based on the principle that one orthographic symbol represents the sound of an entire syllable which is comprised of one (or no) consonant followed by a vowel. At first glance the syllabic system is strikingly different in appearance from the alphabetic orthographies we are familiar with. Each large geometic shape represents a consonant value and the particular rotation of the character indicates the vowel quality of the syllable. There are four distinctive vowel qualities in Cree so that the four cardinal directions of the rotation represent the vowel of the syllable. In addition to vowel quality, the duration of a vowel is also distinctive in Cree, and a long vowel can be represented in the syllabary by a (•) over the syllable character.

In addition to the syllable signs, there are also symbols for simple vowel and consonant sounds. Notice that the first row of Figure 1 shows syllable characters which do not have a consonant in the syllable and the two right-most columns represent only single consonant sounds. It is thus possible to represent a sequence of VCV with two symbols.

The neat chart of Figure 1 represents the system in what appears to be a highly regular and systematic way. Notice that the rotation of syllable characters in the first three rows is:



However the rotation pattern in the other rows is not the same. Moreover it is difficult to determine by the shape of the character the particular direction of an orientation. That is, the particular part of the character which is indicating the direction is in many cases ambiguous. In the case of ᑭ (ki) and ᓂ (ni) this is especially striking. What emerges then is a dual system of rotation:



The use of syllabics is widespread over a large area of Canada. In general, the only appreciable body of syllabic materials which is readily available is of a liturgical nature. The amount of material which is available for teaching reading to children is at present negligible. It should be noted that for many Native people, syllabics are regarded as a tangible symbol of 'Indianness' and as such have a social value.

Roman Orthography

There are many versions of roman orthography which have been used for Cree. For the purposes of this study only the "Proposed Standard Roman Orthography for Cree" presented by Ellis (1971) will be considered. This orthography has three intended purposes: 1) to represent a close

fit between the distinctive sounds and the letters used, (2) to provide the greatest availability and economy of type style and (3) to provide a resemblance to the standard official language orthographies with a maximum transfer value between Cree and English spelling. Figure 2 summarizes the orthographic symbols of the standard roman orthography for Cree.

Figure 2

STANDARD ROMAN ORTHOGRAPHY FOR CREE

consonants:	p	t	c	k
		s	(š)	h
	m	n		
	w		y	
		(l)		
		(r)		
		(d)		
vowels:	i, ī		o, ō	
	e		a, ā	

The following example illustrates the use of the roman and Eastern syllabic systems for Cree:

Torāntohk pitamā e-wī-itohteyān, eko māka mīna Mōliyāhk

ᑐᕋᐢᑐᒃ ᐱᑕᒪ ᐁᐧᐃᐧᑐᐅᐦᑎᔭᐢᐣ, ᐁᑯ ᐦᑲ ᒦᓇ ᒪᐢᐯᐃᔭᐢᐦᑲ

Toronto, first I want to go there; and then to Montreal.

The Official Languages

Some characteristics of the orthographies of the official languages, English and French, are important in the discussion of transfer of literacy skills. These aspects will be described as they are relevant to the arguments. For background information here it is only necessary to point out that, relative to any orthography for an Amerindian language, the orthographies of English and French are highly standardized and that the standard forms are widely accepted socially and for educational use.

LEARNABILITY & READABILITY OF PHONEMIC VS. MORPHOPHONEMIC ORTHOGRAPHIES

John Downing (1973: 202-3) points out that:

> . . . linguists and others faced with the task of creating a new orthography for a previously unwritten language, or would-be spelling reformers, face a series of difficult choices. But . . . perhaps the most serious dilemma is the choice between (1) facilitating rapid and effective reading in the literate

> adult and (2) promoting cognitive clarity in the learning-to-read process of beginners. Most English spelling reformers, for example, have concerned themselves with the latter and given little or no thought to the former. In contrast, some academic linguists have rejected reform because of concern for the former, and dismissed rather lightly the psychological needs of the latter. The final practical outcome in literacy development is influenced both by the learning-to-read process and the reading process. The choice depends in the final analysis on cultural and social priorities.

Beginning Readers

The learning-to-read process is the process by which the learner cracks the code of the written language. He must first of all find the system that links the written sumbols to the oral language that he knows. This process is difficult or impossible if it involves concepts or relationships which he does not understand. For example, if the learner does not understand the concept of 'word' and the written language divides sequences of symbols into words, then the learner may be confused (Downing 1973: 78-80). Or if the learner analyses oral speech into different units from the units represented by the graphemes of the orthography, then confusion may also result. (Gibson and Levin 1975: 119-123). If the rules that relate the graphemes to words and structures in the language vary according to a classification of words and structures of which the learner is not aware, he will have difficulties (Gillooly 1973: 178). It must be kept in mind that most of those learning to read are children whose language development is not yet complete and whose concepts about their language are probably different from those of adult speakers. Also one's awareness of language structure is largely covert, even for an adult, and particular relationships between the language and the orthography may not be part of an individual's conscious knowledge.

Throughout most of this century, linguists and reading experts have assumed that the ideal orthography is one in which there is a one-to-one correspondence between all the phonemes of the language and the graphemes of the orthography. The learner would then have only to learn the concept of phoneme and relate each phoneme to one grapheme. It appears that such a system is easier to learn than other alphabetically based systems. For example, it is reported that the Initial Teaching Alphabet (i.t.a.), an alphabet designed for English, but with a nearly perfect one-to-one correspondence between graphemes and phonemes, is easier to learn to read than traditional English orthography (Warburton and Southgate 1969). Both English and French have a many-to-many sound to symbol relationship. That is, a particular sound may have different spellings, and one letter or sequence of letters may stand for more than one sound, or perhaps no sound at all (see Schane 1968: 16). Children whose first language is English or French have difficulty at the initial stages of learning to read these languages, partly because it is hard for them to comprehend the complex nature of the sound to symbol relationships.

Studies comparing American children learning to read English with

German children learning to read German (the German writing system has more regular phoneme-grapheme correspondences than English), show that German children are superior to American children in word recognition at the end of the first two grades (Preston 1953; Samuels 1969). It appears that the phonemic unit is fairly easy for children (and other beginning learners) to learn to manipulate, and that a one-to-one relationship between phonemes and graphemes is clear and easy for them to operate on.

Intermediate Readers

Does this initial advantage in learning to read give the learners a continuing advantage in reading over learners who are using an orthography dependent on more complex language concepts and language-grapheme relationships? The answer seems to be an unqualified "no". Warburton and Southgate state:

> The evidence suggests that, for most children in most schools, the use of i.t.a. as an initial teaching alphabet would considerably raise the children's standard of reading and their rate of scholastic progress, although it seems likely that this advantage would be lost after transition to traditional English orthography).
>
> (Warburton and Southgate 1969: 276)

Gillooly (1973:183) reports that the initial advantage of the German children over the American children is lost in later grades. He summarizes research which indicates that (1) American children are superior to German children in reading speed at the fourth and sixth grade levels, (2) that the incidence of reading disabilities is roughly equivalent in the two counties, and (3) that the American children are either equal or slightly superior to the German children in reading comprehension. These data, then, indicate that a one-to-one relationship of phonemes to graphemes does not result in in advantage for reading beyond the initial stage of learning to read.

What gives the readers of traditional English orthography an equal opportunity to, or even an advantage over, the readers of simpler writing systems after the initial stages of learning to read? Many researchers in the field of learning to read now believe that the answer lies in the demonstrable fact that traditional English orthography does not always represent the 'sound' level of English, but often a more abstract level of the language, often referred to as morphophonemic (Gillooly 1973; Smith 1975; Venezky 1967). At this morphophonemic level, some of the phonological rules of the language are by-passed so that information about the meaning of words can be more directly revealed. For example, we spell 'relative' and 'relational' so that the root of the words, the first five letters, are the same. The root parts of these words are pronounced rather differently:

[rɛlətɪv] relative

[rəleʃənəl] relational

but these differences in pronunciation are entirely predictable according to phonological rules that every speaker of English sub-consciously knows. Also we spell differently many common words that sound the same. In this way it is easier to grasp the meaning when the context is unclear. For example:

> they're green shoes
> their green shoes
> there are green shoes

It may also be true that, even at the initial stages of learning to read, by-passing some phonological rules in a writing system might be an advantage to the learning process. Some interesting information has been brought forward by Charles Read. He analysed the writing of preschool children who had learned the names of the lettersof the English alphabet and who had spontaneously begun to write without formal instruction in English spelling. Regularities in the children's writing led Read to conclude that the children analysed the articulatory features of English and suited their spelling to this analysis. Read (1975: 344) concludes:

> A child may come to school with an unconscious notion of phonological categories, in terms of a hierarchy of articulatory features that define for him an ordering of more and less significant phonetic variation. In his first encounter with standard spelling, he may seek some systematic relationship to this analysis, rather than to unanalysed phonemes. If so, the difference between these systems defines an important part of literacy instruction. Thus, examining children's phonological judgements may have practical significance.

Read's study suggests that the 'unanalysed phoneme', so highly regarded by many (adult) experts in the fields of language and reading, is not as important to these children as the rules which govern the arrangements of phonetic features in combination. Thus, further research in this area might reveal that children who are beginning to read prefer a system that clearly reveals the phonological rules of the language, just as their older fellows at the intermediate stages of reading seem to prefer morphophonemic clarity. If this were the case, then it would appear that the rules, not the units as adults now generally define them, are the most psychologically real to the children.

Mature Readers

What attributes of a writing system facilitate the rapid effective reading of the literate adult? Mature readers certainly do not puzzle out each word by sound as they read -- going from letter to letter. It seems that mature readers do not even 'read' every word, but sample the text here and there to confirm or deny their hypotheses about the meaning of the passage (Smith, 1971). Getting the meaning is the essential part of reading and there is some evidence to suggest that mature readers almost

completely by-pass the phonological level of the language as they read (Smith and Holmes, 1971). This would mean that an orthography that more clearly reveals morphological features of the language should be more efficient for mature readers than a purely phoneme-based system.

In his review of studies on reading efficiency in mature readers, Gillooly concludes that this is not the case. He quotes studies on the eye movements of mature readers of many different types of orthography which conclude that ". . . the general nature of the reading act is essentially the same among all mature readers" (1973: 185). He also cites a Chinese-English comparison of reading speed which revealed no significant difference in the content covered per unit of time. On this basis Gillooly concludes:

> . . . that while writing system characteristics affect the early and intermediate stages of learning to read, they do not influence the reading process once the skill is attained.
> (Gillooly, 1973: 186)

To sum up the previous discussion, then, there appear to be three stages in the learning to read and reading process. At the initial stage the learner attends to the relationship between the phonology of the language and the orthography. It seems that either regularity of correspondence of sound to grapheme, or the use of psychologically appropriate phonological units on which to base the graphemes, or both, would provide for maximum learnability at this stage. After a few years of literacy training, the learner seems to be aided by the presence in the writing system of devices which indicate some of the morphophonemic rules of the language, even if these devices hide some phonological information. Once they have passed through these two learning stages, however, literate adults seem to be unaffected by the characteristics of the writing system. The data on which these conclusions concerning learning to read were based, were obtained from studies of children who began their literacy training at about age 6. The relevance to literacy training of adults or older children is not certain.

Learning Stages and the Cree Orthographies

Both the roman and syllabic systems would seem to be well suited to the needs of the literacy learner at the initial stage of learning to read since they are phonologically based and they have regular correspondence between the graphemes and the phonemes. The evidence brought forward by Read suggests that the 'unanalysed phoneme' might not be the ideal orthographic unit for initial learners. He recommends that researchers be aware of the fact that young children may focus on certain articulatory features that blur phonemic distinctions. We feel that the same approach should be taken with Cree. Phonemically based orthographies have been successfully used with learners of many different language backgrounds. And we have no evidence that Cree learners would analyse their phonology into other than phonemic units. But we feel that it would be useful if Cree literacy teachers of young children were aware of the fact that their pupils may encounter some difficulties.

On the basis of the foregoing discussion, it would appear that Cree learners who use either the syllabic or the roman orthography are likely to benefit from the tendency of phonemically based orthographies to facilitate learning at the beginning stages of learning to read more than morphophonemically based orthographies. They would probably be in the same position as German readers at the intermediate learning stage. That is, they would not do as well in reading speed as learners who were using an orthography which revealed some of the morphophonemic aspects of the language. And at the final stages of the acquisition of reading skills, mature readers of Cree probably neither benefit nor suffer from the characteristics so far considered of the orthographies.

Syllabic and Alphabetic Orthographies

Psychological Reality of Sound Units

As pointed out above, the task of learning to read is made difficult or impossible if there is a mismatch between the language units on which the orthography is based and the learner's concepts about the language. The best supporting evidence in favour of the learnability of any orthography, then, would be that the language units on which it was based had more psychological reality than any other units. In a review of literature on experiments relating to the psychological reality of syllables and phonemes, Gibson and Levin (1975) found no conclusive data in favour of either type of unit for adult subjects. However, they report on a number of experiments with young children in which the children were asked to identify or manipulate phonemes and syllables. In general, the children were able to deal successfully with syllables long before phonemes. Gibson and Levin (1975: 92), taking into consideration these experiments on both children and adults, conclude that:

> These findings do not mean that syllables or even phonemes may not be efficient perceptual units, but that one linguistic level is not intrinsically more real than another ... it is difficult for young children to segment, that is, pay attention to phonemes, but they can with training attend to units at that level. Similarly, syllables appear to be more available than phonemes under certain task requirements.

For the purposes of orthography development or selection, an important consideration would therefore be the age at which literacy training is begun. If literacy is to be introduced to very young learners, then the use of a syllabic system would be valuable. It would by-pass the problem of having to teach the children to attend to phonemes. But for learners after the age of eight or so, the problem does not seem to be acute (see also Downing 1973: 200).

Evidence from Other Syllabic Systems

Without drawing exact comparisons to alphabetic literacy acquisition, there are reports which attest to the ease with which syllabic systems

are learned. Gelb (1963: 203) mentions a variety of rather obscure sources. The most likely source for information on syllabic literacy is material on modern Japanese. In Japanese writing, two syllabaries, each containing 48 characters, are used. Unfortunately for our present purposes, however, these syllabic characters are combined with logographic characters in normal writing. Therefore it is hard to separate the effects of the problems of reading logographs from those of reading the syllabaries. Makita and Sakamoto (in Downing, 1973: 446-60) say that almost all Japanese children can read hiragana, the most commonly used syllabary, before they are of school age. They also report that "more than 99% of people in Japan are literate, the major exception being the mentally retarded." Makita conducted a survey which indicated that less than one per cent of Japanese children have reading disabilities, but since reading in this case included the reading of logographs as well as the syllabary, it is hard to judge the role of the syllabic system in this remarkable statistic. Sakamoto and Makita offer as part of their explanation for the low Japanese rate of reading disability that:

> Kana (the syllabaries) . . . are phonetic signs that usually consist of a consonant and a vowel, represented in a single letter and carrying no meaning per se. Kana, then, are more comparable to the Roman alphabet. The difference, however, lies in Kana being representations of syllable sounds that are consistently read in the same way. The Roman alphabet represents unitary phonemes, and the ways they are read in a language such as English vary according to their combinations. In other words, whereas each syllable sound is represented by a specific corresponding Kana in Japanese, as is each phoneme in the i.t.a. medium for English, this is not the case in the traditional use of the Roman alphabet in English. Thus either stable or unstable script-phonetic relationships are caused. Although there is no difference between Kana and the conventional use of the Roman alphabet in English, inasmuch as the comprehension of a spelled word is not to be expected unless the reading of each individual letter is completed, the multiple variability of the reading of an alphabetical letter in languages such as English is more confusing and misleading.

Learning Letter Names and Pronouncing Sound Units

Turning to research on alphabetic systems, we find a number of aspects which have potential relevance to the syllabic-alphabetic comparison. Downing (1973: 209-12) and Gibson (1975: 295) cite considerable research which indicates that learning the names of the letters in English and Russian does not help a child to learn to read. Letter names in English give little useful information about the sound which the letter might represent in a piece of English text (particularly 'H', 'W' and 'Y'). Syllables, on the other hand, are pronounceable by themselves. In learning to recognize and write the characters of a syllabic system, then, the need is eliminated to learn letter names other than the sound which the syllable grapheme would represent in writing.

Gibson (1975: 291) discussing literacy training in English for small children, points out that phonemic discrimination should be taught by having children listen to units no smaller than a syllable. She cites a study which demonstrates that:

> . . . phonemic invariance can not be extracted from a smaller speech sample than a syllable. Asking children to do so is not only artificial (and absurd to them), it is impossible.

This particular pedagogical problem is minimized in the teaching of syllabic reading and writing.

Number of Graphemes

The number of graphemes that must be memorized is inevitably larger for a syllabic writing system than for a phonemic one. There are always more possible syllables in a natural language than there are phonemes. But the task of identifying graphemes seems minor beside the other learning tasks involved in learning to read. Most alphabetic systems have a variety of alternative forms (upper and lower case, cursive and printed, etc.) and some, such as Hindi, have alternative forms of some graphemes to indicate morphophonemic information such as position in the word. Syllabic systems generally do not have these types of variation. Also, syllabic systems can contain diacritic devices to systematically reduce the number of graphemes considerably.

Of course syllabic systems can only be used for languages which have a relatively restricted inventory of syllable shapes. The syllable structure of Cree is fairly simple. This makes the use of a large number of symbols unnecessary. The syllabic orthography uses 61 characters and two diacritics, and the roman orthography uses only about 17 characters and one diacritic for vowel length. At first glance this difference in the number of symbols to be learned seems to be quite significant. Evaluating the importance of the number of graphemes to be learned reading Chinese as compared with English, Downing (1973: 196) questions however:

> . . . whether the sheer number of characters to be memorized is <u>in itself</u> such a significant cause of difficulty in learning to read and write as has been commonly supposed.

Certainly if the number of graphemes in a logographic system is not a major factor in reading difficulty then in choosing between syllabic and roman orthography for use with Native languages, differences in the number of characters should probably not be a consideration of any priority.

Reversals of Order in Grapheme Sequences

Another problem discussed by Downing (1973: 207) is confusion over the order of reading or writing the letters of a word by learners

of English literacy. He points out that "mixed order of syllables is not reported as a problem in children's learning of the Japanese syllabary script." He does not, however, mention any other orthographies in this regard. If a child were learning a more phonemically based orthography than English, it is reasonable that he would not be as likely to skip along the letters of the word or even on to later words to get essential decoding information. Intuitively, it seems that a syllabic system would minimize such sequence reversals relative to a phoneme based system.

Visual Length and Complexity of Words

The use of a syllabic writing system for any particular language would produce visually shorter words than that of a phoneme based system, provided that both systems were equally regularly related to the phonology of the language. There is little experimental evidence which would show that visual word length affects reading in any particular way. Gough (1972) describes two experiments which indicate, in effect, that it takes longer to read English words that have more letters in them. But then, it probably takes longer to process a spoken word if it has more sounds in it. Gibson and Levin (1975: 198) point out that:

> Length of word has sometimes been considered an important variable for recognition, but length is apt to be confounded with frequency and thus is not necessarily a uniquely graphic feature.

All languages have longer and shorter words, and it might be possible to prove, if frequency of usage were controlled for, that shorter words are recognized faster than long ones within certain ranges of length. The value that might accrue from the use of a syllabic system in order to visually shorten words would obviously be relative to the normal length of words in that language. Algonquian languages with their long verb forms might fall into this category. There is no reason that other boundaries than word boundaries (some morpheme boundaries, for example) could not be marked in order to visually break up written words into more manageable segments.

If the visual complexity of the individual graphemes for each system were controlled for, a word written in a syllabic system would be visually less complex than one written in a phoneme based system. Would this reduction in complexity be an advantage or a disadvantage? Catell (see Gibson and Levin 1975: 195) demonstrated that adults typically read in units of words. Each written word, then, must provide the reader with enough information to indicate its distinctiveness but at the same time be simple enough to be readily identifiable. For any type of writing system for any language it seems there is probably a middle range of readable conformation of words.

Characteristics of Individual Graphemes and Complexity

The question of the visual effectiveness of phonemic and syllabic systems also depends to some extent on the form of the individual graphemes. The discussion of length and complexity of words in the previous section is particularly related to this. Research into the recognition of logographs reported by Downing (1973: 203) indicates that a minimum level of complexity must be maintained for easy processing.

He quotes a study by Kawai which showed that "normal adults read more complex Kanji (Chinese characters) more easily than less complex Kanji with frequency of usage controlled." He also cites Liong and his finding that the optimal number of strokes in a Chinese character is eleven or twelve plus or minus four. It is difficult to relate studies of logographs to problems pertaining to phonologically based systems. Are logographs roughly equivalent to words in our terms, or syllables, or individual letters? For the purposes of the present study, the question of the role of visual complexity must be held in abeyance until empirical research can be done to determine optimal ranges and to compare the two orthographies in relation to such ranges. It is relevant to Cree orthographic questions to determine whether the complexity of an individual grapheme or the complexity of words or larger units is the most critical in the processing of written Cree texts.

Orientation Reversals of Graphemes

A good deal has been written about the problems of teaching children to discriminate between various roman letters. The main problems seem to be in the orientation reversal of letters such as 'p' for 'q', 'b' for 'd' and 'N' for 'Z', and in the reversal of sequences of letters such as 'saw' for 'was' (Gibson, 1975: 294-5; Downing, 1973: 203). Shankweiler and Liberman (1972) tested children who had reading problems in English and normal young readers, and concluded:

> Though in the poor readers we have studied, reversals are apparently not of great importance, it may be that they loom larger in importance in certain children with particularly severe and persisting reading disabilities.

They also report that:

> Among the poor third-grade readers, sequence reversals (reversals among several letters) and orientation reversals (of a single letter) were found to be wholly uncorrelated with each other.

The problem of reversals and of making fine distinctions such as the difference between 'P' and 'R' do not seem to be severe, and children can be trained to overcome these difficulties (Gibson and Levin, 1975: 239-246.)

All this research was done on children learning to read English. It should be noted that among the graphemes of English there are very few that are horizontal or vertical orientation reversals of each other. In the Cree roman alphabet there is no letter 'q' or letter 'b', so two further possibilities for reversal are eliminated. However, in the case of the Cree syllabary alternation of orientation is fundamental to the orthographic system. It would seem entirely possible that the problem of inversions and orientation reversals would be much more severe in learning the syllabary than in learning the roman orthography.[3]

Transparent Identity of Sounds Through Shapes

In most phonologically based writing systems, the choice of the shape of graphemes is completely arbitrary. There is nothing about the particular shape of most graphemes which indicates anything about the relationships between categories of the sound units represented. For example, there is nothing about 'A' as opposed to 'B' which indicates that one is a vowel and the other is a consonant. And there is nothing about the Japanese syllable character ' か ' (ka) which indicates that it begins with the same consonant as ' き ' (ki) or has the same syllable as ' ま ' (ma). The Cree roman system presents little exception to this. We can see that 'a' (short a) is related to 'ā'(long a). On the other hand, the Cree syllabic system shows a number of phonological correspondences. One shape is used for all syllables beginning with a particular consonant. The orientation of that shape indicates the syllable nucleus that is to to be used. Also long vowels are identified with their short counterparts because they are marked in the system by using the short vowel syllable together with a diacritic.

Therefore, it could be argued that the Cree syllabary does not require the memorization of a large set of independent characters, but that the orientation of the characters gives a clue to the phonological value of the sumbol. However, in view of the somewhat arbitrary criteria for determining the basic orientation, referred to in the description of the syllabic system, and the potential difficulty of discriminating orientation, as discussed above in the problem of reversals and inversions, the advantage of the transparent phonological relationships between Cree syllabic characters relative to roman characters may be compromised.

Conclusions on Reading Efficiency

The evidence we have been able to gather for this section on reading efficiency has generally offered only indirect answers to our questions. We were able to find very little material comparing the effects of different types of orthographies on reading and learning to read, and we found virtually no direct comparisons relevant to the comparison of syllabic as opposed to phoneme based orthographies. However, the findings lead us to the conclusion that there is probably no real difference between the learnability of the Cree roman and Cree syllabic orthographies because they are equally grounded in the phonology of the language. Our comparisons of more specific aspects of syllabic and roman orthographies have had less definite results. For none of the aspects considered did we find that there was concrete evidence of the superiority of the syllabic or roman orthographies. We find no reason to recommend the use of one orthography rather than the other or that any changes should be made in the existing orthographies.

The value of the above discussion is twofold: (1) it suggests several areas in which experimental research would be useful and (2) it gives some indication of potential problem areas for the teaching of reading and writing in either orthography. Three aspects emerged as deserving of further attention. The first is that it may be easier for very young children to manipulate syllables than phonemes, because syllables are pronounceable by themselves and therefore are easier to talk about

in class, and because there is no need to learn names for the graphemes other than their actual phonological value in the writing system. The second is that words written in syllabics may be shorter and less complex than those written in the roman script. This is merely speculation at this point and its value for improving the perception of written words is undetermined. The third aspect is that of the problem of reversals. There is reason to believe that, while sequence reversals of syllabic graphemes may be less frequent than those of roman graphemes, reversals of orientation of individual graphemes may cause a much more serious problem for learners of syllabics than for learners of the roman system. It is hoped that further study will be made to discover the actual effect of these aspects of the orthographies on those acquiring literacy in Cree. And if Cree literacy teachers were made aware of the potential problems, they might be able to avoid difficulties in the classroom.

TRANSFER OF LITERACY SKILLS

At present literacy in an Algonquian language appears to have a limited functional role in Native society. Then why is Native language literacy being introduced at all? A complete answer to this question would be very complex and no doubt different for each program and for each school. Nonetheless there are several arguments which are commonly put forth in support of Native literacy programs. These arguments include the promotion and maintenance of the traditional culture, the development of a strong sense of Native identity amongst Native children, and the promotion and maintenance of the Native language. A further argument, that general school performance of Native children will be improved as a consequence of the Native language program, is consistently raised in support of these programs.

In the case of the development of reading skills, this claim for improved school achievement has at least two distinct aspects. Improved school achievement in reading may result first from the social-psychological factors referred to above, and second from the transfer of reading skills from one language to another. In this section, our aim is to consider the extent and nature of the tranfer of skills that may be anticipated in the various types of programs that exist. This is not to discount the effect of social-psychological factors, which are no doubt extremely important, but which fall outside the scope of this study.[4]

The discussion of transfer of literacy skills will be organized into four types of situations based on the students' first spoken language and the students' first language of reading:

	Native language dominant	Official language dominant
Official language literacy first	A	B
Native language literacy first	C	D

Figure 3

The Type A Situation

Cell A represents the situation which is common in northern Ontario, where official language literacy is taught in the primary grades to children who speak only or mainly a Native language. In some schools these students may receive instruction in English/French as a second language before, or at the same time as, literacy in this language is introduced. In many of these schools, literacy in the child's first language, the Native language, is introduced around grade four. With reference to the issue of transfer in this situation, then, the question centres on the relationship of learning to read in the Native language after first learning to read in an official language. Mountsford states that:

> Second-language learning is not the same as first-language learning. In learning to speak a second language we are not acquiring articulacy over again but extending our existing articulacy. As literates in our first language of literacy we are not, in learning to read a second language, acquiring literacy over again, but extending our existing literacy . . . Literacy is acquired once-for-all, like linguacy itself.
> (quoted from Downing, 1973: 71)

If this is in fact the case, then what literacy skills do children in this type A situation have from their initial literacy experience which may be of consequence in developing literacy in another language? They would have developed the essential concept that language can be represented by two-dimensional marks. Furthermore, they probably know how to name, discriminate and write the graphemes of the offical language they have learned, as well as recognize that certain graphemes or combinations of graphemes can be counted on to represent particular sounds either in most words or at least in some kinds of words.

If these students are to begin Native language literacy using the syllabic system, then they will have to learn a new set of graphemes. It will not be novel to them that these graphemes have names, and it may be helpful to them that in the case of syllabics, the names of the graphemes are the same as the sounds represented by the graphemes. However, the child will have to learn to focus on the systematic relationship between the shape of the grapheme and the consonant sound represented, and the orientation of the grapheme and the vowel sound. The difficulty of such a task, coming after a roman system has been learned, is uncertain.

In addition, the children will have learned to divide English/French speech into segmental phonological units: that is, individual consonants and vowels, as well as segmenting sentences into words. In the syllabic system they will have to focus on syllable-sized units, not individual vowels and consonants. Nonetheless, the conceptualization of these individual sounds will be useful in the recognition and use of the syllable-final consonant symbols of the syllabic writing system. In the official languages, words tend to be relatively short and discrete items. In the Algonquian languages, however, words tend to be very much longer, with considerably more internal complexity than is the case in English/French.

Individual words in the Algonquian languages therefore require that far more attention be paid to the internal structure of words than is the case for recognizing words in an official language.

As noted earlier, English and French speaking children have initial difficulties learning to cope with the complex sound-symbol relationships in these writing systems. How much more difficult it must be for a learner who does not speak the language (see Downing 1973: 337-338). To the Native child who has learned to read in an official language, the straightforward sound-symbol correspondence of syllabics may be a pleasant relief simply because he is going from a more complex system of correspondences in the second language to a less complex system of correspondences in the first language.

What are the possible areas of transfer in this type A situation when the second language of literacy, that is the Native language, is taught in the roman alphabet and not in the syllabic script? First, the child will not have to learn a new set of graphemes. In fact, fewer graphemes are needed for Cree than for either English or French. However, the sound correspondences for the graphemes will be different. This is not only true because the official languages have a many-to-one sound-symbol correspondence, while the Native language roman orthographies tend to have a one-to-one sound-symbol correspondence, but also because graphemes such as t stand for different phonetic qualities in each language. However, these phonetic values share many features in common and this may serve as a useful mnemonic device for prompting the sound value of a grapheme. It is of course possible that students may initially tend to substitute the previously taught English/French phonetic value of a grapheme for the Cree phonetic value, but this is not likely to be a significant factor as the students in this situation are Native language dominant and hence more likely to rely on the phonology of their dominant language. A second area of possible transfer is in the use of diacritic marks. Recall that Cree utilizes diacritics to indicate the phonemic distinction of vowel length. Those students who first learn to read English before the Native language will be faced with diacritics for the first time while those students who read in French before the Native language will be more familiar with the use of diacritics as part of an orthographic system. On balance, it would appear to us that because the units of the respective orthographies are generally equivalent, the use of a roman orthography for the Native language may prove to be a smoother transition following literacy training in an official language than the use of a syllabic orthography.

The Type B Situation

Cell B in Figure 3 represents those schools where the Native children speak only or predominantly an official language and learn their Native language as a second language. The main language of the school is English or French and literacy in this language is taught first, while literacy in the the Native language is taught as a component of the second language program. This type of program is fairly common in Native schools located in the southern part of Ontario. Since the children are fluent speakers

of an official language, we can assume that learning to read in their first language is unexceptional.

Literacy in the Native language is generally introduced after a year or two of oral instruction in the Native language. The factors involved in transfer of reading skills in this situation are nearly identical to those outlined for the type A situation above. It should be noted however, that the regular sound to symbol correspondence of the Native language orthography, whether syllabic or roman script, is particularly helpful for second language learners who may tend to rely more heavily on phonetic cues in reading than do readers who are more fully proficient in the language. This would be even more the case because the early Native language training of the children is orally based. Learning to read may serve to reinforce the oral langugage learning which is occurring (Warburton and Southgate, 1969).

The Type C Situation

At present, Cell C situations do not exist in Ontario, although gradual transition programs from the Native child's first language, the Native language, to an official language have been advocated by a number of educational and Native organizations (Ontario Ministry of Education, 1975; National Indian Brotherhood, 1972). The principle behind such a program is the progression from the known to the unknown, that is, there is a gradual transition in the language of instruction from the student's first language to an official language. In the area of literacy training this principle has been widely accepted (UNESCO 1953; Gray 1956; Downing 1973).

If a child first learns to read in syllabics, what will be the consequences for reading transfer when he is introduced to reading in an official language in grade 2 or 3? First of all, the child will be faced with learning a new and quite different set of graphemes. A potential difficulty arises in recognizing the difference between syllabic units and single segmental units. This task is confounded in English and French by the lack of correspondence between the letter names and their phonetic equivalents which is not the case in the syllabic system. Furthermore the child in learning syllabics is likely to focus on orientation as a clue to recognizing the phonetic value of a character. However, orientation is of little help in recognizing letters in the roman script. The additional complexity of the roman characters compared to the syllabic characters may serve to reduce the difficulty in adjusting to the recognition of roman characters. Evidence was previously presented which indicated that increased character complexity simplified the task of recognition. However, further elaborations, such as the use of punctuation and upper and lower case letters, may remain problematic in learning the roman system.

If the child first learns to read the Native language using the roman script, some of the difficulties mentioned above will likely be reduced. However some difficulty may arise through the confusion of the phonetic value of letters in their Native language orthography with those of the English/French orthography. This is more likely to be a

problem than in the Case A Situation, since the transition is from first to second language.

Transfer of reading has been repeatedly used as a rationale for the choice of roman orthographies over syllabic ones (cf. Ellis, 1971; Todd, 1971). On an even broader scale, promoting reading transfer has been one of the most compelling assertions made by the proponents of transitional bilingualism programs the world over (UNESCO, 1953). In the few instances where data has been presented to support transitional programs, the evidence has been from the transfer of reading skills. It has been axiomatic in bilingual education that learning can be most effectively accomplished when the instruction in the early years of education is in the mother tongue of the child.

Data in support of this claim is available from studies such as Nancy Modiano's (1973) work in the Chiapas region of Mexico where Tzeltal speaking children attend either schools conducted only in Spanish, or schools with utilize a transitional program from Tzeltal into Spanish. After five years, the children in the transitional program were found to read Spanish better than the children in the all Spanish school. This is particularly remarkable as the transitional students had been reading Spanish for only two years, while the all Spanish program children had been reading Spanish for five years, three years longer. Similar findings have been reported elsewhere (see Engle, 1975; Bratt-Paulston, 1975).

However one of the difficulties with such an axiomatic approach to transitional programs is the ready availability of clear counter-examples. The most striking counter example comes from the French language immersion programs for English speaking children. Lambert and Tucker (1972) describe such a program where all education is initially carried out in French. Reading in French is taught first beginning in the second year (age 6). After the third year of immersion, English language study is introduced. By the end of the fifth year the French immersion students are equal to, or better than, students in the regular English school not only in reading and writing French, but surprisingly in reading English as well.

Consider as well the evidence of the Rizal Experiment in the Philippines (Ramos, Anguilar and Sibayan, 1967) where students were in a transition program from Tagalog to English. In this case, however, it was found that reading ability in English was closely related to the number of years of English instruction. In other words the transition students did not show positive transfer of reading skills from Tagalog to English.

These data are well known and have been commented on in the pedagogical literature (Engle, 1975; Bratt-Paulston, 1974, 1975; Bowen, 1977). A variety of social, historical and pedagogical factors have been proposed to account for the discrepant data.

The conclusions of Southgate and Warburton (1969) regarding the initial teaching alphabet previously referred to are also relevant to this discussion. Recall that they reported that English speaking children

who initially learned to read in i.t.a. showed a marked enhancement of reading ability compared to students who begin reading in Standard English Orthograph (S.E.O.). However, this initial advantage was not transferred to reading in S.E.O. In fact those students who began reading in i.t.a. end up reading S.E.O. only about as well as children who were reading S.E.O. throughout their schooling. This lack of positive transfer was observed across social classes. Moreover, it is not possible to claim that language fluency had any constraining effect on reading transfer as most of the students in the study were native speakers of English.

We would like to suggest a solution to these above data by considering the level of orthographic representation involved. Previously we mentioned that English and French orthographies have been frequently referred to as morphophonemic in nature, while both the syllabic and roman orthographies for Cree are basically phonemic. This distinction between morphophonemic and phonemic orthographies allows for the demonstration of a principle which seems to account for these problematic data. The following table summarizes these data:

Figure 4

L_1	1st literacy	2nd literacy	transfer
Tzeltal	Tzeltal (phonemic)	Spanish (phonemic)	yes
English	French (morphophonemic)	English (morphophonemic)	yes
Tagalog	Tagalog (phonemic)	English (morphophonemic)	no
English	i.t.a. (phonemic)	English (morphophonemic)	no

Notice that where the level of orthographic representation of both languages is essentially the same, transfer takes place but where the level of representation of the two orthographic systems is different, no positive transfer is reported. Although this generalization is simply consistent with the data and further investigation is required to more adequately support the claim, such an analysis does suggest that the character of orthographies is a factor to be considered in planning bilingual education programs.

Consider what this implies for the teaching of literacy in a bilingual situation involving Cree. Both the Cree orthographies referred to are of the phonemic type while English and French are monphophonemic. Therefore it could be hypothesized that spontaneous transfer of reading skills from Cree to an official language cannot be expected. However this does not mean that bilingual programs involving the Cree language are not potentially extremely beneficial. Rather, it means that a high degree of reading transfer cannot be

necessarily anticipated, and that the curriculum in such programs must compensate by concentrating on developing the awareness of the students of the difference in the orthographic conventions. How important this factor may be in relation to the other perceptual factors mentioned previously, remains to be ascertained through further research.

The Type D Situation

There is only one school at present in Ontario of the Cell D type. At West Bay on Manitoulin Island the children are English monolinguals or English dominant. One school program however is conducted primarily in Ojibwa, a language closely related to Cree. Ojibwa is used as the language of instruction in the nursery and kindergarten years, and Ojibwa literacy in the roman script is introduced in grade one. Literacy in English is introduced in grade two.

The areas of concern with regard to the transfer of reading skills in this situation are much the same as those discussed in the type C situation. One major difference is that in the Cell C situation the students speak the Native language as a first language which they learn to read at school. In this Cell D situation the children are learning to read in their second language. Thus, as noted in the discussion of the type B situation, it is probably easier for the second language learner to learn to read in an orthography that is closely tied to the sounds of the language. Both the roman and syllabic scripts are satisfactory on this ground.

Conclusions on Transfer

This outline has merely sketched some areas which should be recognized as possibly influencing the transfer of reading skills from one language to another. The precise amount of difficulty or benefit to be derived from any one of the areas remains to be explored. What is important however, is that planners and particularly teachers be aware of the possible effects of reading in a first or second language and of orthography switch for the beginning reader. This awareness in turn may lead to the development of programs and instructional techniques which capitalize on the positive aspects of reading transfer and compensate for the negative aspects. The most important generalization to be made here is that, if the students are going from one orthography to a different type of orthography (i.e., from either official language to syllabics or from syllabics to an official language) they will have the task of learning new material and concepts. On the other hand, if the students are going from a Native roman orthography to an official language or from an official language to a Native roman orthography, the task of learning new material and concepts may be less, but the risk of confusion of the two systems will be much greater.

CONCLUSION

This study has been concerned with two main issues: first, the possible effect of Native language orthography choice on the teaching of reading, and second, the possible influence of the organization of a bilingual program on the teaching of reading. We recognize that a number of other very influential variables in the choice of an orthography for Native use have not been discussed. For example, it is recognized that each Native language occurs in a substantial number of readily distinguishable dialects. If it is decided that the orthography should be closely tied to the phonetic identity of surface elements of the spoken language, then either each dialect will have to use its own version of the orthography, or one dialect will have to be chosen as basic and the speakers of the other dialects will have to learn to 'correct for' the discrepancies between the dialect of the orthography and their own dialect (see Downing 1973: 181-216). If, on the other hand, it is decided to use an orthography that is based on a more abstract level of phonology, it is possible that the writing system would satisfactorily represent most dialects, which would thus be mutually intelligible in written, even if not in oral, form.

The choice of a particular orthography must necessarily be based on a consideration of a number of social as well as linguistic factors. It is not our intention to propose the social priorities that should be followed in choosing an orthography. But we would point out that three possibly conflicting sets of needs might influence the effectiveness of any orthography in the overall social context: 1) the needs of the young child learning to read to have the language represented in a way that is conceptually clear to him, 2) the needs of the more mature user of a writing system to be able to communicate easily with others who are also literate in the language, and 3) the needs of the second language learner to have the language written so that he can readily interpret the writing system in a meaningful way. Each of these points out that an orthography is merely a device for representing language and as such it must be useful. Therefore, in choosing an orthography, one must consider the current use of Native language orthographies in Ontario and also consider what uses are anticipated in the future.

An adequate account of current literacy practice amongst Native language literates is not available. However, it is clear that a considerable number of Native adults are literate in their own language. In the case of literates in an Algonquian language they may be using either a syllabic system or some variation of a roman orthography. The obvious areas of use are reading and writing for personal communication, and reading as a part of religious observance. In addition there are also some magazines, newspapers and occasionally government documents which are written in a Native language. We have already referred to the use of Native literacy in education. Nonetheless the availability of written material in the Native languages, and the functional utility of literacy in these languages is at present considerably more limited than is the case for the official languages. The development of skilled mature readers requires extensive practice on a wide array of materials and in the absence of such material perhaps the needs of the mature reader with respect to orthography choice are the least urgent to consider.

Rather it would seem reasonable that the concern for Native language orthography and literacy be focused instead on the needs of the early and intermediate reader. Moreover, given that the use of Native language literacy in Native language teaching is becoming more widespread, the needs of the second language learner should also be a concern for the educator. For both beginning reading and second language learning there is considerable evidence that a phonemic type of writing system is an initial advantage.

In this paper we have attempted to outline some of the psycho-linguistic factors involved in reading which may be significant for the development of bilingual literacy by Native students. The particular importance of many individual factors remains to be assessed through research both in and out of the classroom setting. What is clear however is that there are a host of factors which need to be considered in order to assure that the development of reading skills in a bilingual program is not impeded by instructional programs which do not carefully consider the needs of the learner. There is every reason to believe that literacy in Cree and other Native languages can add a valuable new dimension to Native schooling when these precautions are heeded.

FOOTNOTES

1. Another well-known syllabic system was developed for Cherokee by a Cherokee, Sequoia. However, this system is unrelated to the Evans system. A description of Sequoia syllabary is contained in Walker (1969).

2. Charles Fiero, "Style Manual for Syllabics" Appendix B in Department of Indian and Northern Affairs, Instructor's Manual to Accompany Basic Course in Syllabic Typing: Olivetti Keyboard 1112 or 1115 (Ottawa Department of Indian and Northern Affairs, 1976) p.39.

3. John Nichols (personal communication) of Lakehead University states that orientation on individual characters is the greatest difficulty for his Native adult students who are learning syllabics.

4. See discussion of such issues in Burnaby (1979).

5. It is worth noting that Rozin and Gleitman (1977) have argued that the characteristics of an orthography are crucial factors in the development of reading skills even in the first language.

REFERENCES

Bowen, J. Donald. "Linguistic perspectives in bilingual education" in Bernard Spolsky (ed.), Frontiers in Bilingual Education. Rowley, Mass: Newbury House, 1977.

Bratt-Paulston, Christina. "Implications of language learning theory for language planning: Concerns in bilingual education." Papers in Applied Linguistics, Bilingual Series: 1. Arlington, Virginia: Center for Applied Linguistics, 1974.

_____. "Ethnic relations and bilingual education: Accounting for contradictory data." Working Papers on Bilingualism, No. 6 (1975), pp. 1-44.

Burnaby, Barbara. "Roles of Languages in Education for Native Children in Ontario." Unpublished Ph.D dissertation. University of Toronto, 1979.

Downing, John. "Children's thought and language in learning to read." Paper prepared for Focus Group on "Reading in the Elementary School" at the annual convention of the National Council of Teachers of English, Las Vegas,Nevada, November 26, 1971.

_____. Comparative Reading: Cross National Studies of Behavior and Processes in Reading and Writing. New York: The Macmillan Company, London: Collier-Macmillan Ltd., 1973.

Ellis, C. Douglas. Spoken Cree: West Coast of James Bay. Part 1. Toronto: The Anglican Church of Canada, 1962.

_____. "A proposed standard Roman orthography for Cree," Western Canadian Journal of Anthropology, Vol. 4, No. 3 (1971), pp 1-37.

Engle, Patricia Lee. "The use of vernacular languages in education," Review of Educational Research, Vol. 45, No. 2, (1975), pp. 283-325.

Fiero, Charles. "Style Manual for Syllabics," Appendix B in Department of Indian and Northern Affairs, Instructor's Manual to Accompany Basic Course in Syllabic Typing: Olivetti Keyboard 1112 or 1115. Ottawa: Department of Indian and Northern Affairs, 1976.

Gelb, I.J. A study of Writing. Chicago: University of Chicago Press, 1952, second edition, 1963.

Gibson, Eleanor J. "Theory-based research on reading and its implication for instruction" in J.B. Carroll and Jeanne S. Chall (eds.), Towards a Literate Society. New York: McGraw-Hill, 1975.

Gillooly, William B. "The influence of writing-system characteristics on learning to read." Reading Research Quarterly, Vol. 8, No. 2 (Winter 1973), pp. 167-199.

Gough, Philip B. "One second of reading" in James F. Kavanagh and Ignatius G. Mattingly (eds.), Language by Ear and by Eye: The Relationship between Speech and Reading. Cambridge, Mass. and London, England: The M.I.T. Press, 1972.

Gray, W.S. The Teaching of Reading and Writing:An International Survey. Paris: UNESCO, 1956.

Lambert, Wallace and G. Richard Tucker. Bilingual Education of Children: The St. Lambert Experiment. Rowley, Mass: Newbury House, 1972.

McNeill, D.A. and K. Lindig. "The perceptual reality of phonemes, syllables, words and sentences." Journal of Verbal Learning and Verbal Behavior, Vol. 12 (1973), pp. 419-430.

Modiano, Nancy. Indian Education in the Chiapas Highlands. Case Studies in Education and Culture Series. New York: Holt, Rinehart and Winston, 1973.

National Indian Brotherhood. Indian Control of Indian Education. Ottawa: National Indian Brotherhood, 1972.

Ontario Ministry of Education. People of Native Ancestry: A Resource Guide for the Primary and Junior Divisions. 1975.

Preston, R.C. "Comparison of word-recognition skill in German and in American children." Elementary School Journal. Vol. 53 (1953), pp. 443-446.

Ramos, M., J. Anguilar and B. Sibayan. The Determination and Implementation of Language Policy. Philippine Center for Language Study Monograph Series, 2. Quezon City, The Philippines: Alemar/Phoenix, 1967.

Read, Charles. "Lessons to be learned from the preschool orthographer," in E. Lenneberg and E. Lenneberg, Foundations of Language Development: A Multidisciplinary Approach, Vol. 2. New York: Academic Press; Paris: The UNESCO Press, 1975, pp. 329-346.

Rozin, Paul and L.R. Gleitman. "The Structure and Acquisition of Reading II: The Reading Process and the Acquisition of the Alphabetic Principle." in A.S. Reber and D.L. Scarborough (eds.) Toward a Psychology of Reading. Hillsdale, N.J: Lawrence Erlbaum, 1977.

Shankweiler, Donald and Isabelle Y. Liberman. "Misreading: a search for causes: in James F. Kavanagh and Ignatius G. Mattingly (eds.), Language by Ear and by Eye: The Relationships between Speech and Reading, Cambridge, Mass. and London, England: The M.I.T. Press, 1972.

Smith, F. Understanding Reading. New York: Holt, Rinehard and Winston, 1971.

_____. "The relation between spoken and written language: in E. Lenneberg and E. Lenneberg, Foundations of Language Development: A Multidisciplinary Approach. Vol. 2. New York: Academic Press; Paris: The UNESCO Press, 1975, pp. 347-360.

Smith, F. and Deborah Holmes. "The independence of letter, word and meaning identification in reading.: Reading Research Quarterly, Vol. 6 (Spring 1971), pp. 394-415.

Todd, Evelyn M. "Ojibwa syllabic writing and its implications for a standard Ojibwa alphabet", Anthropological Linguistics, Vol. 14, No. 9 (1971), pp. 357-360.

UNESCO. The Use of Vernacular Languages in Education. Monograph on Fundamental Education, 8. Paris: UNESCO, 1953.

Venezky, R.L. "English orthography: Its graphical structure and its relation to sound." Reading Research Quarterly, Vol. 2 (1967), pp. 705-105.

Vernon, Magdalen D. Backwardness in Reading. London: Cambridge University Press, 1957.

Walker, Willard. "Notes on native writing systems and the design of native literacy programs." Anthropological Linguistics, Vol. 11, No. 5 (1969), pp. 148-166.

Warburton, F.W. and Vera Southgate. i.t.a.: An Independent Evaluation. London: John Murray and W. & R. Chambers, 1969.